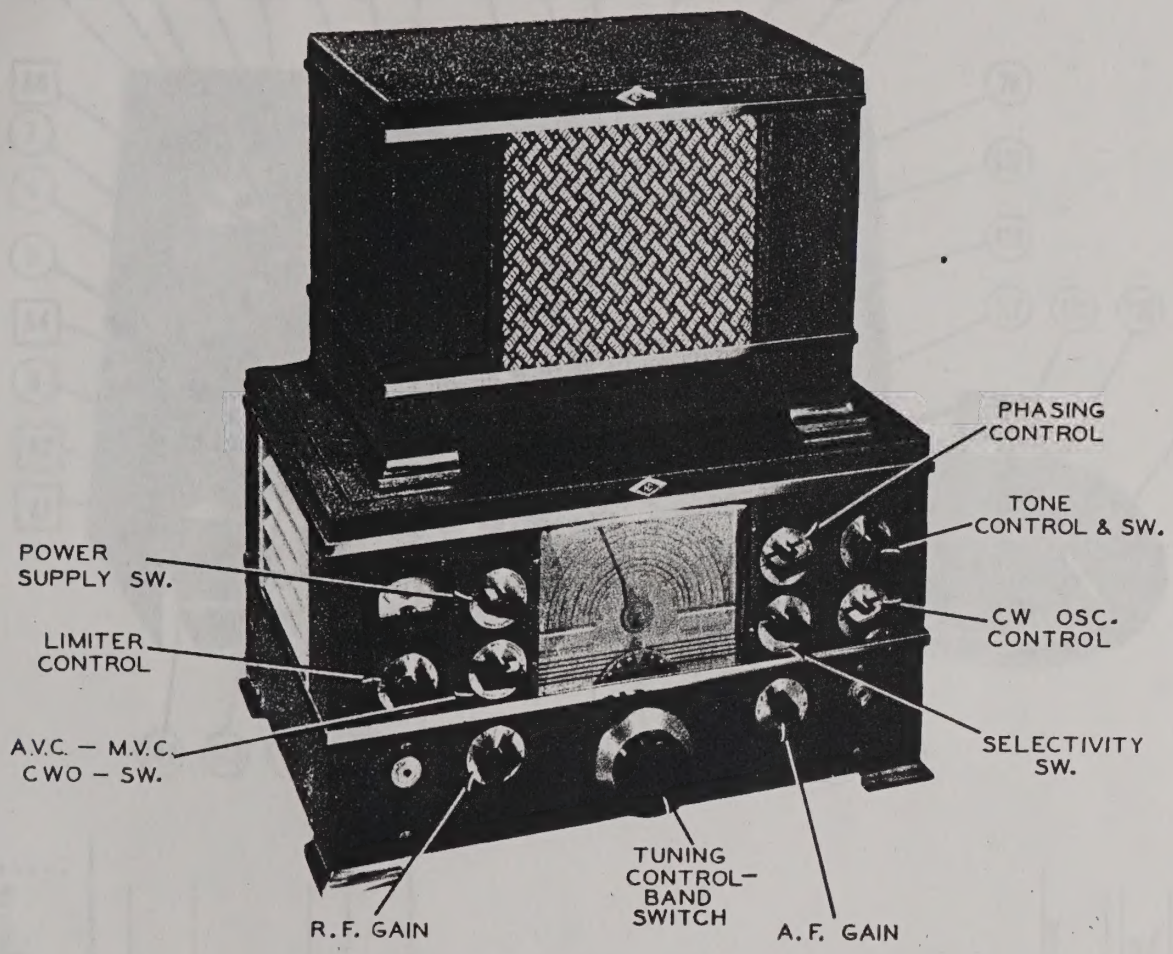
NATIONAL MODELS
NC-2-40DR, NC-2-40DT



NATIONAL MODELS
NC-2-40DR, NC-2-40DT

NATIONAL MODEL NC-2-40DR

TRADE NAME	National, Model NC-2-40DR, NC-2-40DT
MANUFACTURER	National Co., Inc., 61 Sherman St., Malden, Mass.
TYPE SET	AC Operated Communication Six Band Superheterodyne Receiver
TUBES (TWELVE)	Types, 6SK7 RF Amp., 6K8 Mixer, 6J5 Osc., 6K7 1st IF Amp., 6SK7 2nd IF Amp., 6SL7GT 2nd Det.-Limiter, 6SJ7 CW-Osc., 6V6GT AVC, 6SN7GT AF-Phase Inv., (2) 6V6GT Power Output, 5Y3GT Rectifier.
POWER SUPPLY	110-120 Volts or 220-240 Volts AC RATING .75 Amp. @ 117 Volts AC
TUNING RANGE	480-1040KC, 920-2100KC, 1.68-4.05MC, 3.4-4.05MC, 3.4-7.4MC, 6.9-7.35MC, 6.65-14.6MC, 13.8-14.46MC, 13.9-31MC, 26.9-30.05MC.

HOWARD W. SAMS & CO., INC. • 2924 East Washington Street • Indianapolis 6, Indiana

"The listing of any available replacement part herein does not constitute in any case a recommendation, warranty or guaranty by Howard W. Sams & Co., Inc., as to the quality and suitability of such replacement part. The numbers of these parts have been compiled from information furnished to Howard W. Sams & Co., Inc., by the manufacturers of the particular type of replacement part listed." "Reproduction or use, without express permission, of editorial or pictorial content, in any manner, is prohibited. No patent liability is assumed with respect to the use of the information contained herein. Copyright 1948 by Howard W. Sams & Co., Inc., Indianapolis, Indiana, U. S. A. Copyright under International Copyright Union. All rights reserved under Inter-American Copyright Union (1910) by Howard W. Sams & Co., Inc."

PARTS LIST AND DESCRIPTIONS (Continued)

35	15.5	500						"B" " " " "
66	21	500						"C" " " " "
67	38.5	500						"D" " " " "
68	16	500						"A" " RF Coupling
69	38	500						"A" " Padder
70	15.5	500						"B" " " " "
71	21	500						"C" " " " "
72	38.5	500						"D" " " " "
73	900	500						"A" " " " "

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA			INSTALLATION NOTES
	RESISTANCE	WATTS	NATIONAL PART No.	IRC PART No.	CLAROSTAT PART No.	
74A	500KΩ	½		D13-133	M-60-Z	AF Gain Control
B	Shaft			A	Not Req.	Attach to 74A per instructions
75	10KΩ	1½				RF Gain Control
76	10KΩ	1½				Limiter Control
77A	500KΩ	½		D11-133	M-58-S	Tone Control
B	Shaft			A	Not Req.	Attach to 77A per instructions
C	Switch			41	SW-A	" " " " "

RESISTORS

ITEM No.	RATING		REPLACEMENT DATA		IDENTIFICATION CODES
	RESISTANCE	WATTS	NATIONAL PART No.	IRC PART No.	
78	1.5 Meg.	½		BTS-1.5 Meg.	Br.-Grn.-Grn. AVC Network
79	470KΩ	½		BTS-470K	Yl.-Vi.-Yl. " "
80	470Ω	½		BTS-470	Yl.-Vi.-Br. AVC Cathode
81	47KΩ	½		BTS-47K	Yl.-Vi.-Or. Voltage Dropping
82	220Ω	½		BW-½-220	Red-Red-Br. Converter Cathode
83	47KΩ	½		BTS-47K	Yl.-Vi.-Or. Converter Screen Dropping
84	100KΩ	½		BTS-100K	Br.-Blk.-Yl. Bleeder
85	2200Ω	½		BTS-2200	Red-Red-Red Decoupling
86	47KΩ	1		BTA-47K	Yl.-Vi.-Or. Voltage Dropping
87	47KΩ	½		BTS-47K	Yl.-Vi.-Or. Converter Grid
88	22KΩ	½		BTS-22K	Red-Red-Or. AVC Network
89	1500Ω	½			Br.-Grn.-Red 1st IF Cathode-See Note
90	2200Ω	½		BTS-2200	Red-Red-Red 1st IF Decoupling
91	470KΩ	½		BTS-470K	Yl.-Vi.-Yl. AVC Network
92	1000Ω	½			Br.-Blk.-Red 2nd IF Cathode-See Note
93	22KΩ	2		BT-2-22K	Red-Red-Or. Bleeder
94	22KΩ	2		BT-2-22K	Red-Red-Or. Voltage Dropping
95	1000Ω	½		BTS-1000	Br.-Blk.-Red 2nd IF Plate Decoupling
96	2200Ω	½		BTS-2200	Red-Red-Red Detector Plate Decoupling
97	4700Ω	½		BTS-4700	Yl.-Vi.-Red Detector Cathode
98	22KΩ	½		BTS-22K	Red-Red-Or. Detector Output Load
99	100KΩ	½		BTS-100K	Br.-Blk.-Yl. Limiter Cathode
100	47KΩ	½		BTS-47K	Yl.-Vi.-Or. Limiter Grid
101	220KΩ	½		BTS-220K	Red-Red-Yl. BFO Plate Load
102	100KΩ	½		BTS-100K	Br.-Blk.-Yl. BFO Screen Dropping
103	220Ω	2		BW-2-220	Red-Red-Br. Output Cathode
104	100KΩ	½		BTS-100K	Br.-Blk.-Yl. Bleeder
105	470KΩ	½		BTS-470K	Yl.-Vi.-Yl. AVC Network
106	15KΩ	½		BTS-15K	Br.-Grn.-Or. " "
107	2700Ω	2		BT-2-2700	Red-Vi.-Red Bias Network
108	820Ω	2		BT-2-820	Gray-Red-Br. " "
109	1 Meg.	½		BTS-1 Meg.	Br.-Blk.-Grn. " "
110	47KΩ	½		BTS-47KΩ	Yl.-Vi.-Or. AF Plate Load
111	1000Ω	½		BTS-1000	Br.-Blk.-Red AF Cathode
112	47KΩ	½		BTS-47K	Yl.-Vi.-Or. Phase Inverter Plate Load
113	470KΩ	½		BTS-470K	Yl.-Vi.-Yl. Phase Inverter Grid
114	220KΩ	½		BTS-220K	Red-Red-Yl. Output Grid
115	220KΩ	½		BTS-220K	Red-Red-Yl. " "
116	220KΩ	½		BTS-220K	Red-Red-Yl. " "

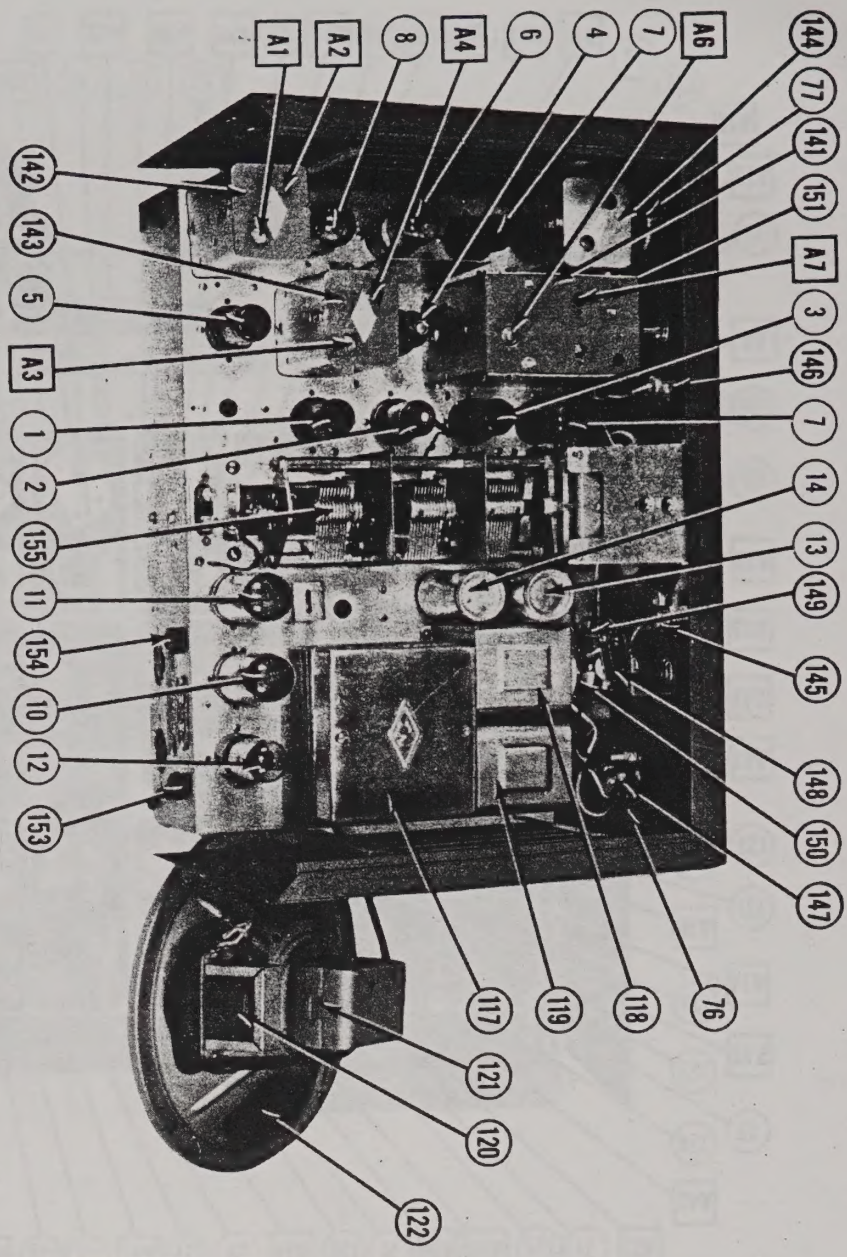
Note-This resistor is selected individually for each receiver and should be replaced according to the value used.

TRANSFORMER (POWER)

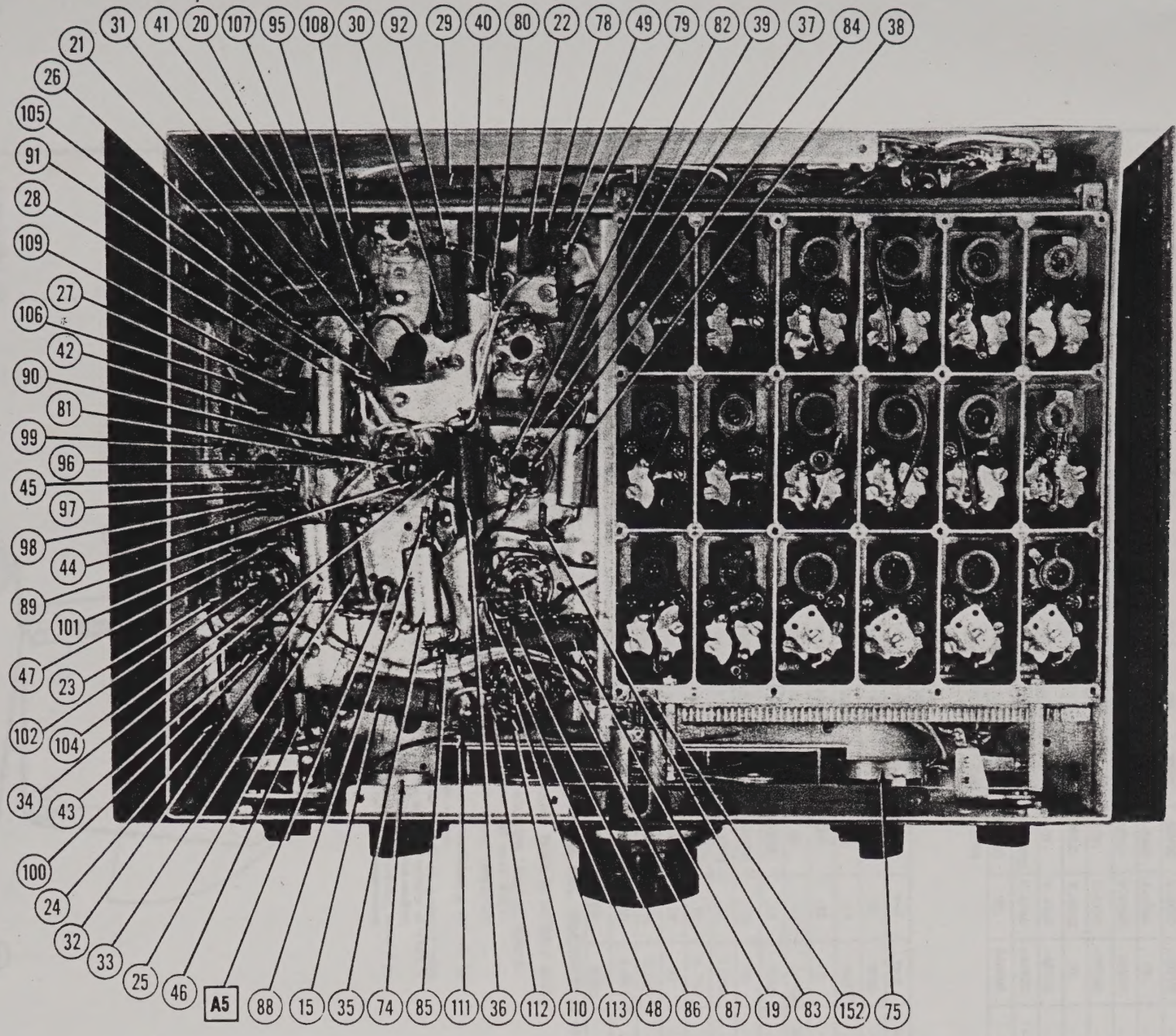
ITEM No.	RATING				REPLACEMENT DATA			
	PRI.	SEC. 1	SEC. 2	SEC. 3	NATIONAL PART No.	STANCOR PART No.	THORDARSON PART No.	MERIT PART No.
117	117V AC @ .75A or 230V AC	800V CT @ .093A	5.0V AC @ 2.0A	6.4VAC @ 4.7A		P-8165#		

#This replacement for 117V AC only.

CHASSIS—TOP VIEW



NATIONAL MODELS
NC-2-40DR, NC-2-40DT PAGE 3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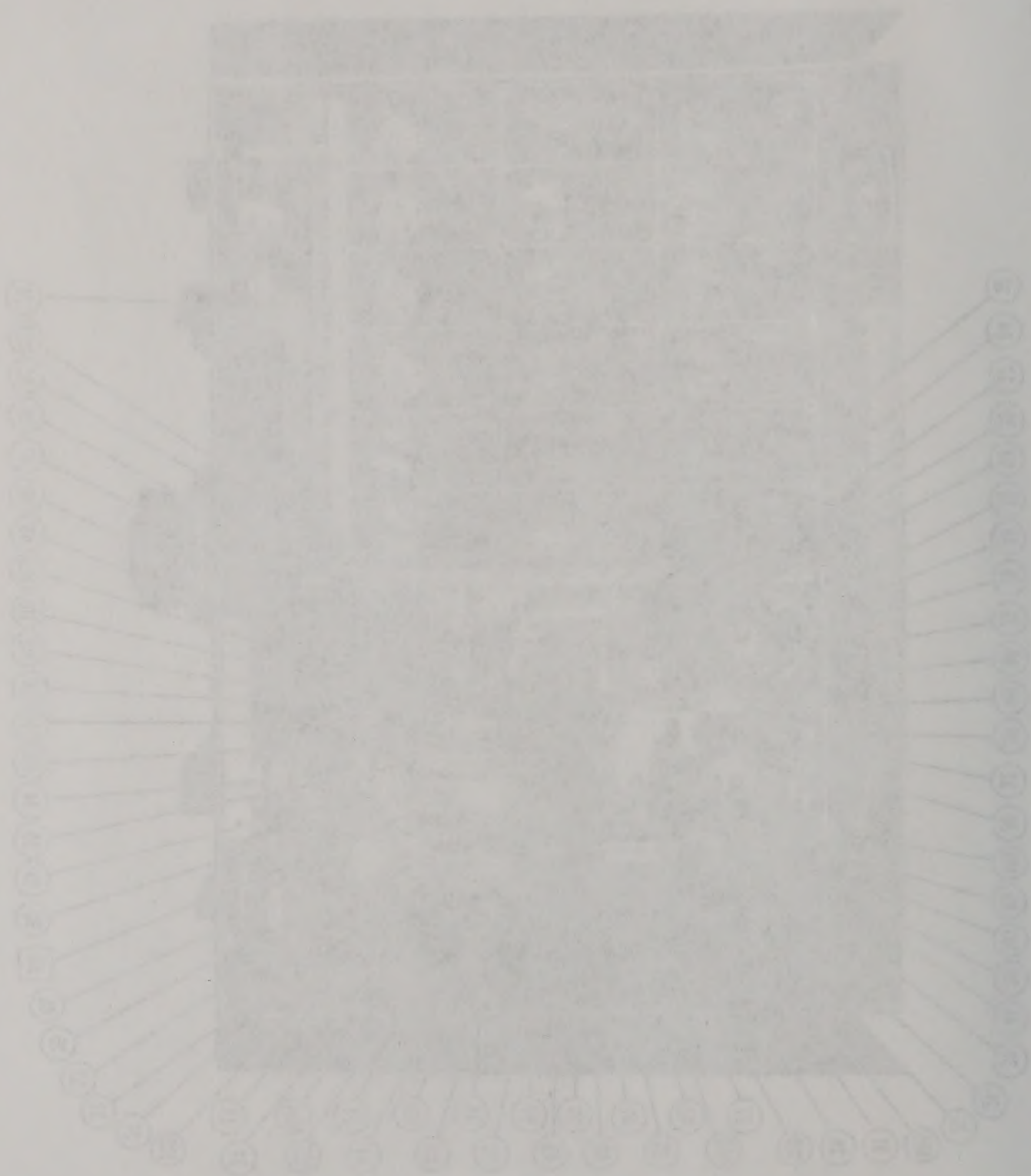

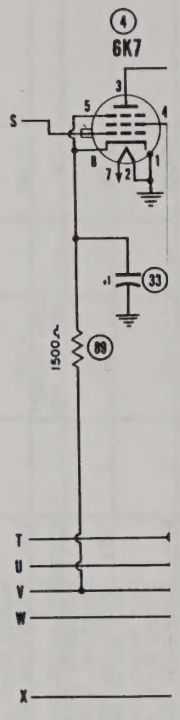

IF=455K

A PHOTOFACT STA

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VOLTAGE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Cap
1	6SK7	0V.	64VAC	2.2VDC	0V.	2.2VDC	60VDC	0V.	200VDC	-
2	6K8	0V.	0V.	197VDC	47VDC	-8VDC§	0V.	6.4VAC	.5VDC	0V.
3	6J5	0V.	0V.	72VDC	117VDC	-8VDC§	0V.	6.4VAC	0V.	-
4	6K7	0V.	0V.	190VDC	60VDC	3.2VDC	0V.	6.4VAC	3.2VDC	0V.
5	6SK7	0V.	0V.	3VDC	0V.	3VDC	60VDC	6.4VAC	190VDC	-
6	6SL7GT	-52VDC	200VDC	-47VDC	-.2VDC	0V.	.3VDC	6.4VAC	0V.	-
* 7	6SJ7	0V.	0V.	0V.	-3VDC§	0V.	15VDC	6.4VAC	50VDC	-
8	6V6GT	0V.	0V.	0V.	0V.	-25VDC	0V.	6.4VAC	-35VDC	-
9	6SN7GT	0V.	110VDC	4VDC	0V.	90VDC	4VDC	6.4VAC	0V.	-
10	6V6GT	0V.	0V.	182VDC	190VDC	-60VDC§	0V.	6.4VAC	-48VDC	-
11	6V6GT	0V.	0V.	182VDC	190VDC	-60VDC§	-5.5VDC	6.4VAC	-48VDC	-
12	5Y3GT	0V.	240VDC	0V.	400VAC	0V.	400VAC	0V.	240VDC	

§TAKEN WITH VACUUM TUBE VOLTMETER.

RESISTANCE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Cap
1	6SK7	0Ω	.1Ω	470Ω	1 Meg.	470Ω	13KΩ	0Ω	30KΩ	-
2	6K8	0Ω	0Ω	32KΩ	50KΩ	47KΩ	0Ω	.1Ω	240Ω	1.4Ω
3	6J5	0Ω	0Ω	80KΩ	80KΩ	47KΩ	INF.	.1Ω	0Ω	-
4	6K7	0Ω	0Ω	32KΩ	13KΩ	1.5KΩ	0Ω	.1Ω	1.5KΩ	520KΩ
5	6SK7	0Ω	0Ω	1KΩ	1 Meg.	1KΩ	13KΩ	.1Ω	31KΩ	-
6	6SL7GT	3KΩ	30KΩ	30KΩ	47KΩ	0Ω	100KΩ	.1Ω	0Ω	-
* 7	6SJ7	0Ω	0Ω	0Ω	47KΩ	2Ω	85KΩ	.1Ω	110KΩ	-
8	6V6GT	0Ω	0Ω	15KΩ	0Ω	1.2 Meg.	15KΩ	.1Ω	2.7KΩ	-
9	6SN7GT	500KΩ	80KΩ	1KΩ	470KΩ	80KΩ	1KΩ	.1Ω	0Ω	-
10	6V6GT	0Ω	0Ω	30KΩ	30KΩ	480KΩ	INF.	.1Ω	2.9KΩ	-
1	6V6GT	0Ω	0Ω	30KΩ	30KΩ	480KΩ	250KΩ	.1Ω	2.9KΩ	-
2	5Y3GT	INF.	30KΩ	INF.	3KΩ	INF.	3KΩ	INF.	30KΩ	

LIMITER CONTROL ON FULL, RF GAIN ON FULL, B+ ON, AF GAIN ON FULL, SELECTIVITY AT #5, TONE CONTROL AT LOW.

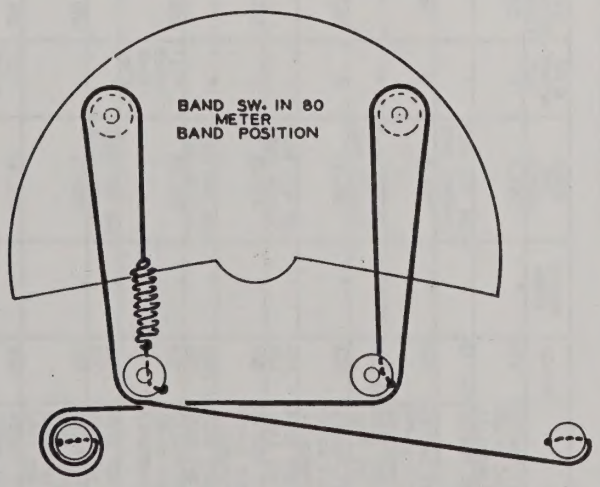
TUBES 10, 11 & 12, VOLTAGE AND RESISTANCE READINGS TAKEN IN 10 METER BAND.

*AVC-MVC-CWO SWITCH IN CWO POSITION.

TUBES 1 through 9, VOLTAGE AND RESISTANCE READINGS TAKEN IN BAND E.

RESISTANCE READINGS IN THE B+ CIRCUITS MAY VARY WIDELY ACCORDING TO THE CONDITION OF THE FILTER CAPACITORS

1. DC Voltage measurements are at 20,000 ohms per volt; AC Voltages measured at 1,000 ohms.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ±15% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements.



ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

RMA Dummy consists of 200 MMFD cap. in series with 20 micronenry choke with choke shunted by 400 MMFD cap. in series with 400Ω carbon resistor.

Use 400 ∿ amp. modulated signal in all Steps of RF Alignment.

In Steps 4, 7, 10, 12, 14 and 16 it is necessary for correct alignment that the oscillator work above the incoming signal. To check this tune signal generator 910KC above the dial reading of receiver. If image signal is not heard, retune signal generator to original frequency and open oscillator trimmer to next peak. Adjust for maximum output and recheck for image.

RF Gain control and AF Gain control should be at maximum (setting at 10) and output of signal generator should be no higher than necessary to obtain an output reading. Use an insulated alignment screwdriver for all adjustments.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1	Direct	High side to grid cap. 6K8. Low side to chassis.	Tune for maximum output between 453 & 457KC (unmodulated signal	F	Tuning cap. fully open.	Across voice coil	A1,A2, A3,A4, A5.	Limiter control should be set at "0", power supply switch to "B+ ON", control switch to "CWO", RF gain control to "10", AF gain Control to "10", selectivity control to "5", phasing control to "0", tone control to "N". Adjust CW osc. for beat note about 400 ∿. After sig. gen. is tuned to maximum output adjust A1, A2, A3, A4 & A5 for maximum output. Use minimum signal input in order to avoid overloading.
2	Direct	"	See Remarks.	"	"	"	A6	Set selectivity switch to "1". Detune signal gen. 3 or 4 KC. Adjust A6 for maximum output. Retune sig. gen. for maximum output. (Setting of Step 1).
3	Direct	"	"	"	"	"	A7	Set selectivity switch to "OFF". Tune for maximum output and adjust A7 for maximum output. Turn phasing control to 0, selectivity switch to "5" and tune sig. gen. for maximum output. Note meter reading. Turn selectivity switch to "OFF". Meter reading should decrease slightly. If an increase is noted Steps 1, 2 & 3 should be repeated as this is an indication of improper IF adjustment.
4	RMA Dummy	High side to ext. ant. post. Low side to chassis.	1.0MC (400Ω Amp. mod.)	"	1.0MC	"	A8	Set control switch "MVC", selectivity switch to to "OFF". Adjust A8 for maximum output. Check for image per prealignment instructions.
5	"	"	"	"	Tune for maximum output.	"	A9,A10	Adjust for maximum output.
6	"	"	500KC	"	500KC	"	A11	Adjust for maximum output. Repeat Steps 4, 5 & 6 until no further improvement can be made.
7	"	"	2.0MC	E	2.0MC	"	A12	Adjust for maximum output. Check for image per prealignment instructions.
8	"	"	"	"	Tune for maximum output.	"	A13,A14	Adjust for maximum output.
9	"	"	1.0MC	"	1.0MC	"	A15	Adjust for maximum output. Repeat Steps 7, 8 & 9 until no further improvement can be made.
10	"	"	4.0MC	D	4.0MC	"	A16	Adjust for maximum output. Check for image per prealignment instructions.
11	"	"	"	"	Tune for maximum output.	"	A17,A18	Adjust for maximum output.
12	"	"	7.2MC	C	7.2MC	"	A19	Adjust for maximum output. Check for image per prealignment notes.
13	"	"	"	"	Tune for maximum output.	"	A20,A21	Rock tuning cap. and adjust for maximum output.
14	"	"	14.0MC	B	14.0MC	"	A22	Adjust for maximum output. Check for image per prealignment notes.
15	"	"	"	"	Tune for maximum output.	"	A23, A24	Rock tuning cap. and adjust for maximum output.
16	"	"	30.0MC	A	30.0MC	"	A25	Adjust for maximum output. Check for image per prealignment notes.
17	"	"	"	"	Tune for maximum output.	"	A26, A27	Rock tuning cap. and adjust for maximum output.
18	"	"	30.0MC	"10" Meter Bandspread	30.0MC	"	A28	Adjust for maximum output. Check for image per prealignment notes.
19	"	"	"	"	Tune for maximum output.	"	A29, A30	Rock tuning cap. and adjust for maximum output.
20	"	"	27.0MC	"	27.0MC	"	A31	Adjust for maximum. Repeat Steps 18, 19 & 20 until no further improvement can be made.
21	"	"	14.4MC	"20" Meter Bandspread	14.4MC	"	A32	Adjust for maximum output. Check for image per prealignment notes.
22	"	"	14.4MC	"	Tune for maximum output.	"	A33, A34	Rock tuning cap. and adjust for maximum output.
23	"	"	14.0MC	"	14.0MC	"	A35	Adjust for maximum output. Repeat Steps 21, 22 & 23 until no further improvement can be made.
24	"	"	7.3MC	"40" meter bandspread	7.3MC	"	A36	Adjust for maximum output. Check for image per prealignment notes.
25	"	"	7.3MC	"	Tune for maximum output.	"	A37, A38	Rock tuning cap. and adjust for maximum output.
26	"	"	7.0MC	"	7.0MC	"	A39	Adjust for maximum output. Repeat Steps 24, 25 & 26 until no further improvement can be made.
27	"	"	4.0MC	"80" meter bandspread	4.0MC	"	A40	Adjust for maximum output. Check for image per prealignment.notes.
28	"	"	"	"	Tune for maximum output.	"	A41, A42	Rock tuning cap. and adjust for maximum output.
29	"	"	3.5MC	"	3.5MC	"	A43	Adjust for maximum output. Repeat Steps 27, 28 & 29 until no further improvement can be made.

PARTS LIST AND DESCRIPTIONS

TUBES (SYLVANIA or Equivalent)

ITEM No.	USE	REPLACEMENT DATA: NATIONAL PART No.	REPLACEMENT DATA: STANDARD REPLACEMENT	RMA BASE TYPE	INSTALLATION NOTES
1	RF Amp.	6SK7	6SK7	8N	
2	Mixer	6K8	6K8	8K	
3	Osc.	6J5	6J5	6Q	
4	1st IF	6K7	6K7	7R	
5	2nd IF	6SK7	6SK7	8N	
6	2nd Det.-Limiter	6SL7GT	6SL7GT	8BD	
7	CW Osc.	6SJ7	6SJ7	8N	
8	AVC	6V6GT	6V6GT	7AC	
9	AF Phase Inv.	6SN7GT	6SN7GT	8BD	
10	Power Output	6V6GT	6V6GT	7AC	
11	" "	6V6GT	6V6GT	7AC	
12	Rectifier	5Y3GT	5Y3GT	5T	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING: CAP.	RATING: VOLT	REPLACEMENT DATA: NATIONAL PART No.	REPLACEMENT DATA: AEROVOX PART No.	REPLACEMENT DATA: CORNELL-DUBILIER PART No.	REPLACEMENT DATA: SOLAR PART No.	REPLACEMENT DATA: SPRAGUE PART No.	IDENTIFICATION CODES AND INSTALLATION NOTES
13A	8	475		GL-475-8-8	KR588A	DY-2x8-450	EL-1	Filter-Red
B	8	475					WR-8	" -Red-White
14	40	200		GL450-40	KR530	DY-50-350	EL-42	Bias Filter
15	10	50		PRS50-10	BR105	M-10-50	TA-510	Inverter Cathode Bypass
16	.1	600		684-.1	DT6P1	ST-6-1	TC-1	Power Supply Bypass
17	.1	600		684-.1	DT6P1	ST-6-1	TC-1	Audio Coupling
18	.1	400		484-.1	DT4P1	ST-4-1	TC-1	" "
19	.1	400		484-.1	DT4P1	ST-4-1	TC-1	" "
20	.1	400		484-.1	DT4P1	ST-4-1	TC-1	Bias Network
21	.1	400		484-.1	DT4P1	ST-4-1	TC-1	AVC Network
22	.1	400		484-.1	DT4P1	ST-4-1	TC-1	AVC Filter
23	.1	400		484-.1	DT4P1	ST-4-1	TC-1	CW Osc. Screen Bypass
24	.01	600		684-01	DT6S1	ST-6-01	TC-11	Audio Coupling
25	.01	600		684-01	DT6S1	ST-6-01	TC-11	Tone Comp.
26	1	200		484-1	DT2W1	SDH-2-1M	TC-10	Audio Coupling
27	.01	600		684-01	DT6S1	ST-6-01	TC-11	Det. Plate Bypass
28	.1	600		684-.1	DT6P1	ST-6-1	TC-1	2nd IF Plate Decoup.
29	.1	400		484-.1	DT4P1	ST-4-1	TC-1	Screen Bypass
30	.1	400		484-.1	DT4P1	ST-4-1	TC-1	2nd IF Cathode Bypass
31	.01	600		684-01	DT6S1	ST-6-01	TC-11	AVC Filter
32	.1	600		684-.1	DT6P1	ST-6-1	TC-1	1st IF Plate Decoup.
33	.1	400		484-.1	DT4P1	ST-4-1	TC-1	1st IF Cathode Bypass
34	.01	600		684-01	DT6S1	ST-6-01	TC-11	AVC Filter
35	.1	600		684-.1	DT6P1	ST-6-1	TC-1	Conv. Plate Decoup.
36	.1	400		484-.1	DT4P1	ST-4-1	TC-1	Conv. Screen Bypass
37	.1	400		484-.1	DT4P1	ST-4-1	TC-1	Conv. Cathode Bypass
38	.1	600		684-.1	DT6P1	ST-6-1	TC-1	RF Plate Decoupling
39	.1	400		484-.1	DT4P1	ST-4-1	TC-1	Screen Bypass
40	.1	400		484-.1	DT4P1	ST-4-1	TC-1	RF Cathode Bypass
41	.1	400		484-.1	DT4P1	ST-4-1	TC-1	RF Bypass
42	1000	500		1468-001	1W5D1	MW.5-21	1FM-21	AVC Filter
43	250	500		1468-00025	5W5T25	MO.5-325	1FM-325	RF Bypass-Cer.
44	1000	500		1467-001	1W5D1	MW.5-21	1FM-21	" "
45	250	500		1468-00025	5W5T25	MO.5-325	1FM-325	" " "
46	1000	500		1468-001	1W5D1	MW.5-21	1FM-21	Tone Comp.
47	2	500						CW Osc. Coup. -Cer.
48	250	500		1468-00025	5W5T25	MO.5-325	1FM-325	Osc. Grid Cap.-Cer.
49	5000	300		1467-005	1D5D5	MW.5-25	1FM-25	AVC Filter
50	750	500						"A" Band Osc. Padder
51	3000	500						"B" " " "
52	1700	500						"C" " " "
53	900	500						"D" " " "
54	1500	500						"E" " " " -Cer.
55	250	500						"F" " " " "
56	29	500						"A" " " " "
57	12	500						"B" " " " "
58	18	500						"C" " " " "
59	35	500						"D" " " " "
60	10	500						"A" Band Fixed Trim. "
61	10	500						"B" " " " "
62	10	500						"C" " " " "
63	29	500						"A" " Osc. Feedback "
64	38	500						"A" " RF Padder "

PARTS LIST AND DESCRIPTIONS (Continued)

FILTER CHOKE

ITEM NO.	RATINGS: TOTAL DIRECT CURRENT	RATINGS: D.C. RESISTANCE	RATINGS: INDUCTANCE (0 CURRENT 1000 ~)	REPLACEMENT DATA: NATIONAL PART NO.	REPLACEMENT DATA: STANCOR PART NO.	REPLACEMENT DATA: THORDARSON PART NO.	REPLACEMENT DATA: MERIT PART No.	INSTALLATION NOTES
116	.093A	280Ω	12.5 Henries		C-2305*	T20C54*	C-3193*	*Drill new mounting holes.
119	.093A	280Ω	12.5 "		C-2305*	T20C54*	C-3193*	*Drill new mounting holes.

TRANSFORMER (OUTPUT)

ITEM No.	RATING: IMPEDANCE PRI.	RATING: IMPEDANCE SEC.	RATING: DC RES. PRI.	RATING: DC RES. SEC.	REPLACEMENT DATA: NATIONAL PART No.	REPLACEMENT DATA: STANCOR PART No.	REPLACEMENT DATA: THORDAR'N PART No.	REPLACEMENT DATA: MERIT PART No.	INSTALLATION NOTES
120	9500Ω CT	7.5Ω	480Ω CT	.4Ω		A-3831	T-22856	A-2901	

SPEAKER

ITEM No.	RATINGS		REPLACEMENT DATA: NATIONAL PART No.	REPLACEMENT DATA: JENSEN PART No.	REPLACEMENT DATA: QUAM PART No.	INSTALLATION NOTES
121	FIELD	VC IMP.		ST-120	10A6	
	PM	7.5Ω		Mod. P10-S		
122	CONE DIA.	VC DIA.				
	9-3/4"	7/8"				

R F COILS

ITEM No.	USE	BAND	DC RES. PRI.	DC RES. SEC.	REPLACEMENT DATA: NATIONAL PART No.	REPLACEMENT DATA: MEISSNER PART No.
123	Ant.Coil	F	.7Ω	3.4Ω		
124	" "	E	1.6Ω	.7Ω		
125	" "	D	.6Ω	.3Ω		
126	" "	C	.3Ω	.2Ω		
127	" "	B	.2Ω	.2Ω		
128	" "	A	.1Ω	.1Ω		
129	RF Coil	F	.3Ω	2.9Ω		
130	" "	E	32.2Ω	1.4Ω		
131	" "	D	14.4Ω	.7Ω		
132	" "	C	7.7Ω	.3Ω		
133	" "	B	2.9Ω	.2Ω		
134	" "	A	.2Ω	.1Ω		
135	Osc.Coil	F	1.2Ω	1.4Ω		
136	" "	E	.7Ω	1.3Ω		
137	" "	D	1.2Ω	.7Ω		
138	" "	C	.3Ω	.2Ω		
139	" "	B	.2Ω	.2Ω		
140	" "	A	.6Ω	1.2Ω		
141	Input IF		12.3Ω	9.5Ω		
142	Inter. If		7.8Ω	7.8Ω		
143	Output IF		7Ω	7.6Ω		
144	Osc. Trans			1.2Ω		

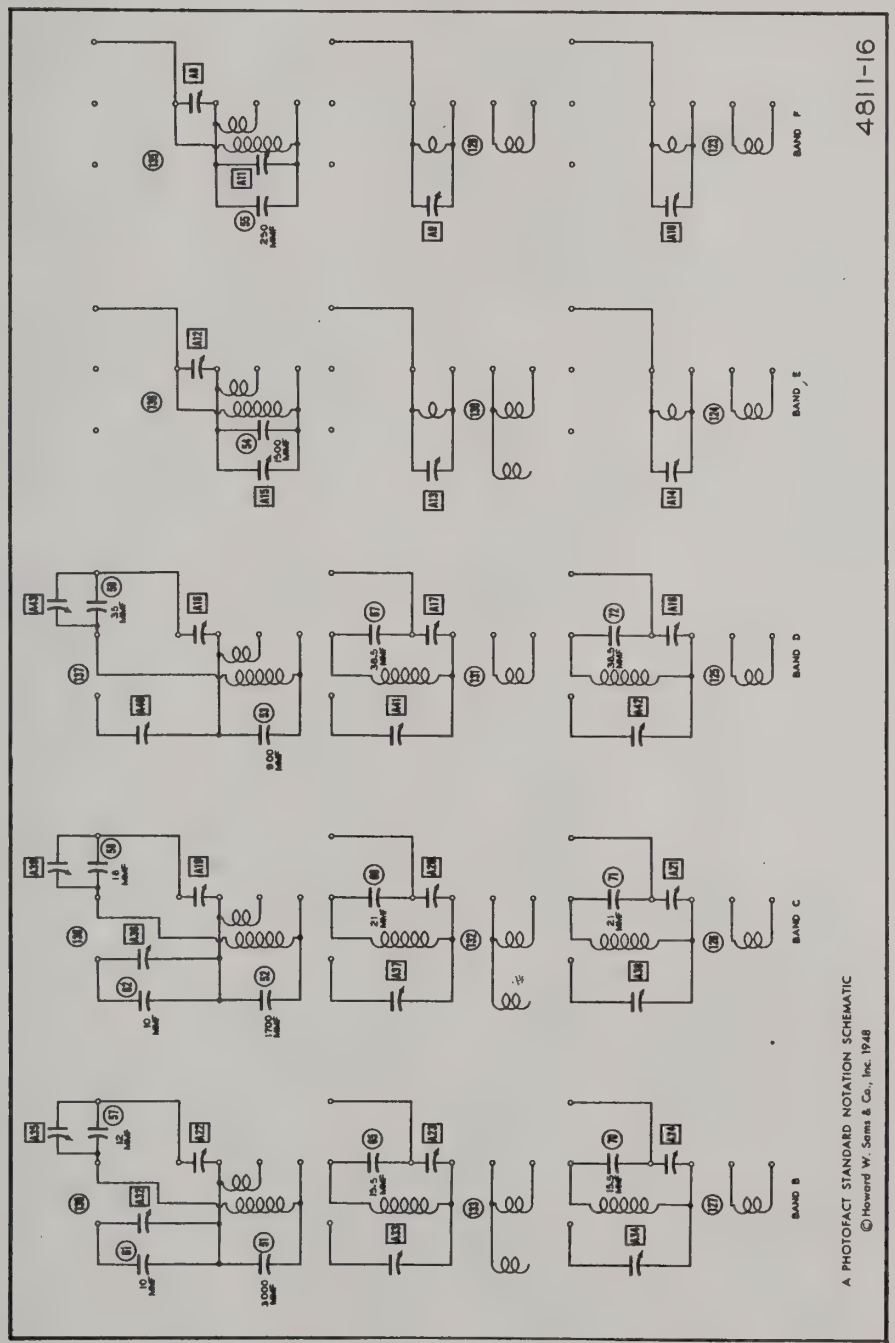
DIAL LIGHT

ITEM No.	BASE TYPE	VOLTS	AMPS.	BEAD COLOR	REPLACEMENT DATA: NATIONAL PART No.	REPLACEMENT DATA:	INSTALLATION NOTES
145	Screw	6-8	0.15	Brown	No. 40		Type 40
146-147	Bayonet	6-8	0.15	"	No. 47		Type 47

MISCELLANEOUS

ITEM No.	PART NAME	NATIONAL PART No.	NOTES
148	Switch		On-Off
149	"		B+ On-Off
150	"		AVC-MVC-CWO
151	"		Selectivity
152	"		Band
153	Fuse		2 Amp.
154	"		1 Amp.
155	3 Gang Var. Cap		(31-260MMF) each section
156	Switch		Line Voltage (110-120V to 220-240V)

STAGE GAIN MEASUREMENTS		
ANTENNA TO RF GRID	14X	600KC
RF GRID TO CONV. GRID	1.5X	600KC
CONVERSION GAIN	25X	IN 600KC OUT 455KC ± 2%
1st IF TRANSFORMER	.1X	455KC ± 2%
1st IF TUBE	100X	455KC ± 2%
2nd IF TRANSFORMER	.6X	455KC ± 2%
2nd IF TUBE	45X	455KC ± 2%
3rd IF TRANSFORMER	.3X	455KC ± 2%
AUDIO	30X	400 ~
OUTPUT	20X	400 ~

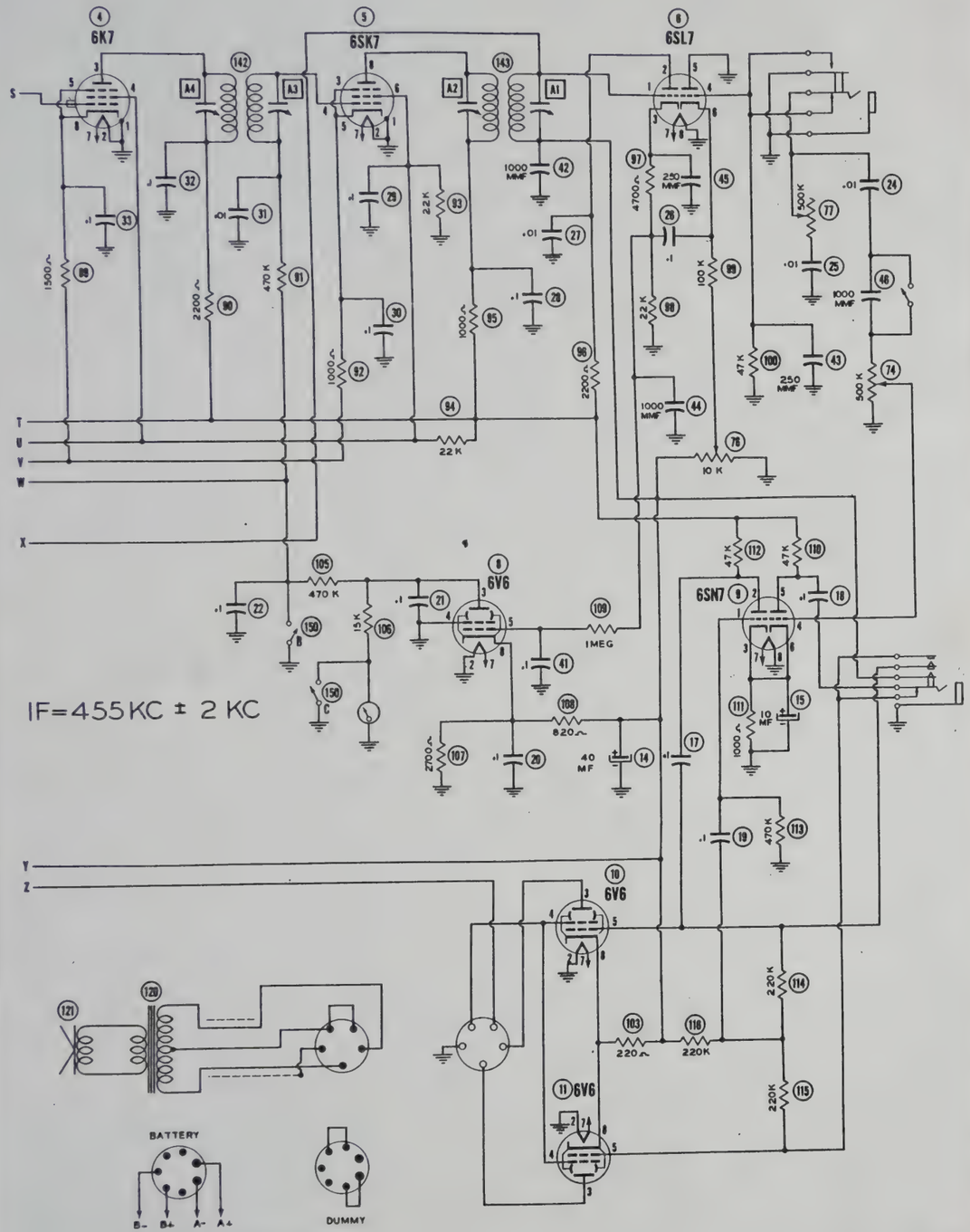


The stage gain measured values listed above approximate values for an average operative stage, rather than an absolute value. It should be borne in mind that it is possible to introduce so many variables into the measurement operation, such as, type of equipment used for measuring, handling and placement of probes, the accuracy of alignment, etc., that an absolute reading is impractical. AVC is made inoperative by connecting negative (-) 3 volts to the AVC line.

7	"	2.0MC	E	2.0MC	"	A12	"	A40	Adjust for maximum output. Check for image per pre-alignment instructions.	
8	"	"	"	Tune for maximum output.	"	A13, A14	Adjust for maximum output.	A41, A42	Rock tuning cap. and adjust for maximum output.	
9	"	1.0MC	"	1.0MC	"	A15	Adjust for maximum output. Repeat Steps 7, 8 & 9 until no further improvement can be made.	A43	Adjust for maximum output. Repeat Steps 27, 28 & 29 until no further improvement can be made.	

27	-	4.0MC	-	4.0MC	"80" meter band-spread	4.0MC	"	A40	Adjust for maximum output. Check for image per pre-alignment notes.	
28	"	"	"	"	"	Tune for maximum output.	"	A41, A42	Rock tuning cap. and adjust for maximum output.	
29	"	"	"	3.5MC	"	3.5MC	"	A43	Adjust for maximum output. Repeat Steps 27, 28 & 29 until no further improvement can be made.	

NC-240 DR/DT



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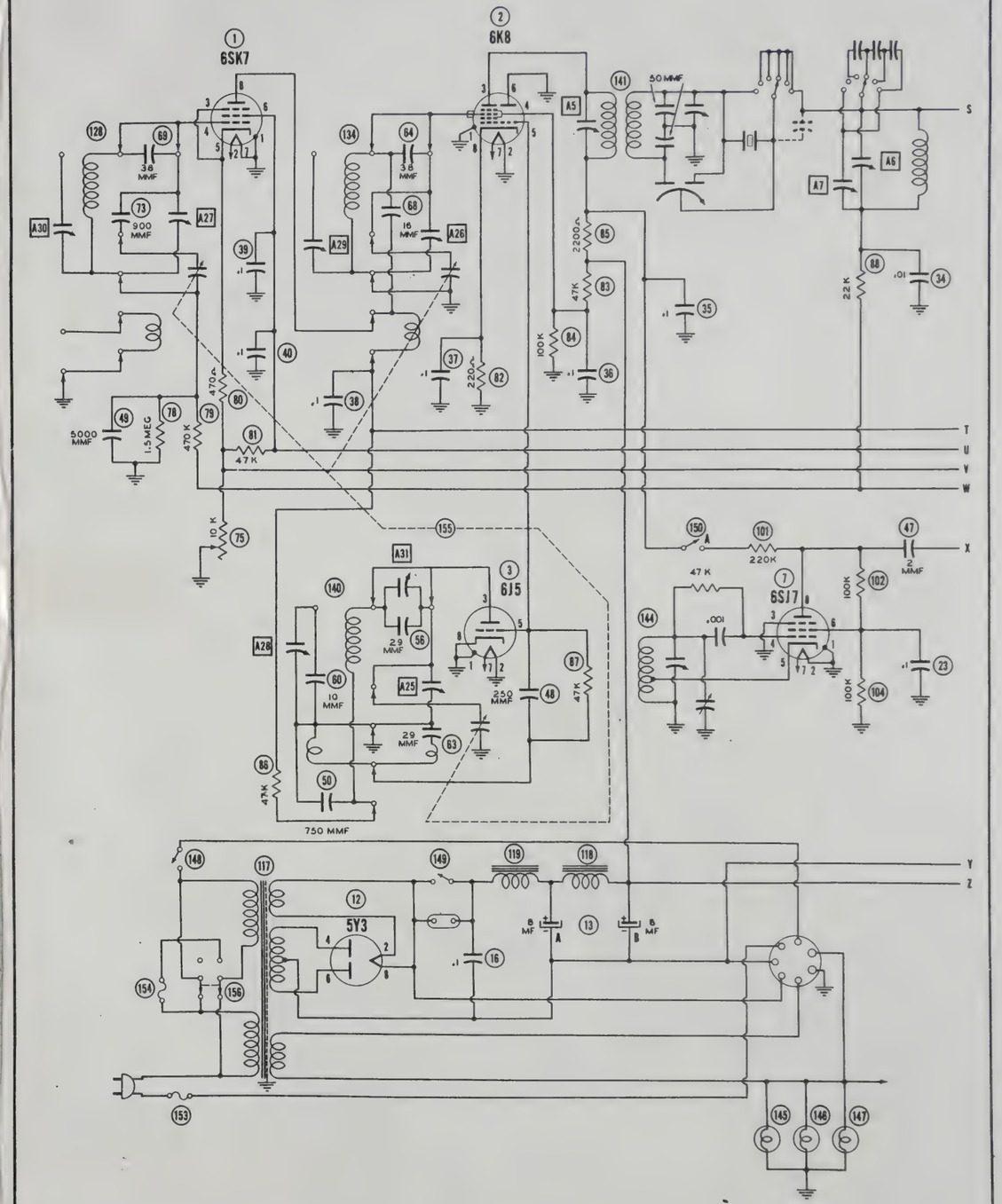

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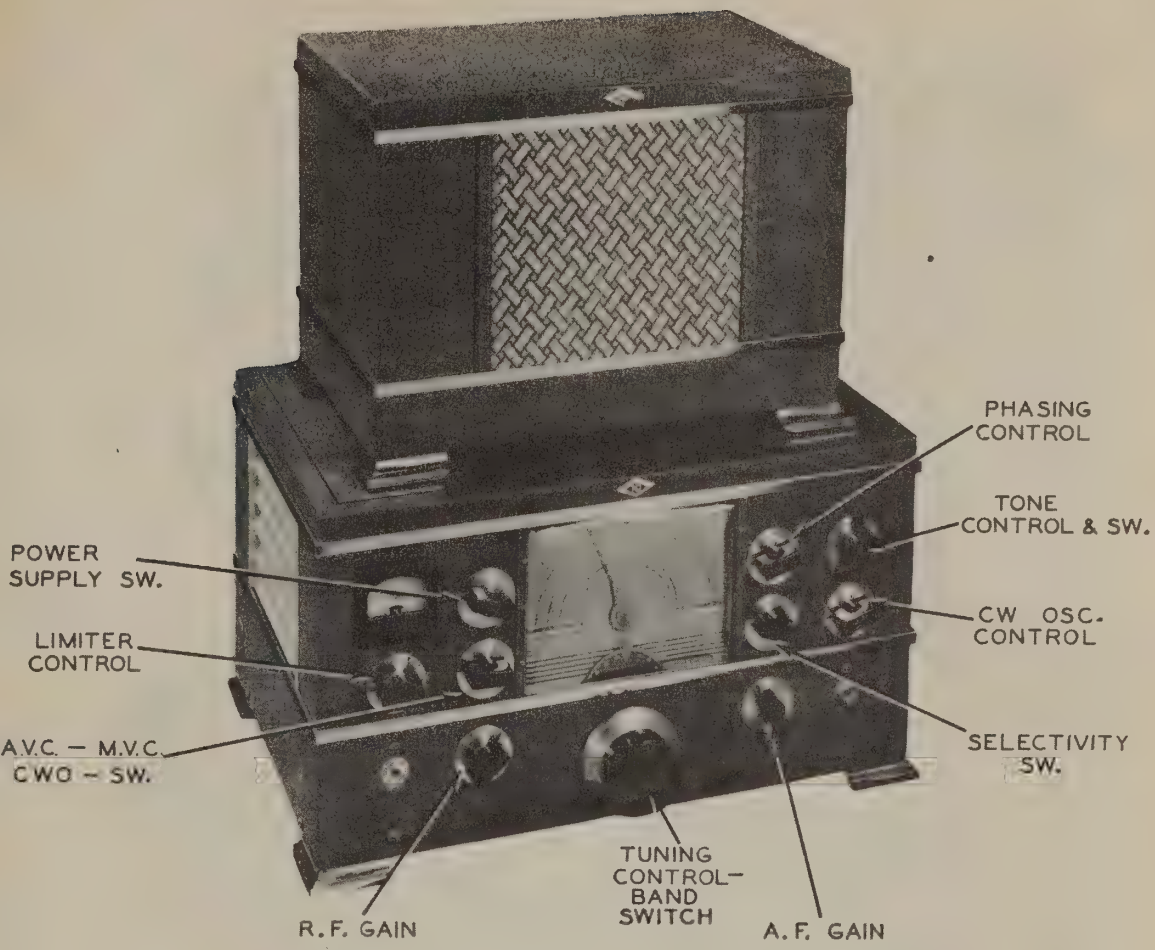
NATIONAL MODELS
NC-2-40DR, NC-2-40DT



NATIONAL MODELS
NC-2-40DR, NC-2-40DT

NATIONAL MODEL NC-2-40DR

TRADE NAME	National, Model NC-2-40DR, NC-2-40DT
MANUFACTURER	National Co., Inc., 61 Sherman St., Malden, Mass.
TYPE SET	AC Operated Communication Six Band Superheterodyne Receiver
TUBES (TWELVE)	Types, 6SK7 RF Amp., 6K8 Mixer, 6J5 Osc., 6K7 1st IF Amp., 6SK7 2nd IF Amp., 6SL7GT 2nd Det.-Limiter, 6SJ7 CW-Osc., 6V6GT AVC, 6SN7GT AF-Phase Inv., (2) 6V6GT Power Output, 5Y3GT Rectifier.
POWER SUPPLY	110-120 Volts or 220-240 Volts AC RATING .75 Amp. @ 117 Volts AC
TUNING RANGE	480-1040KC, 920-2100KC, 1.68-4.05MC, 3.4-4.05MC, 3.4-7.4MC, 6.9-7.35MC, 6.65-14.6MC, 13.8-14.46MC, 13.9-31MC, 26.9-30.05MC.

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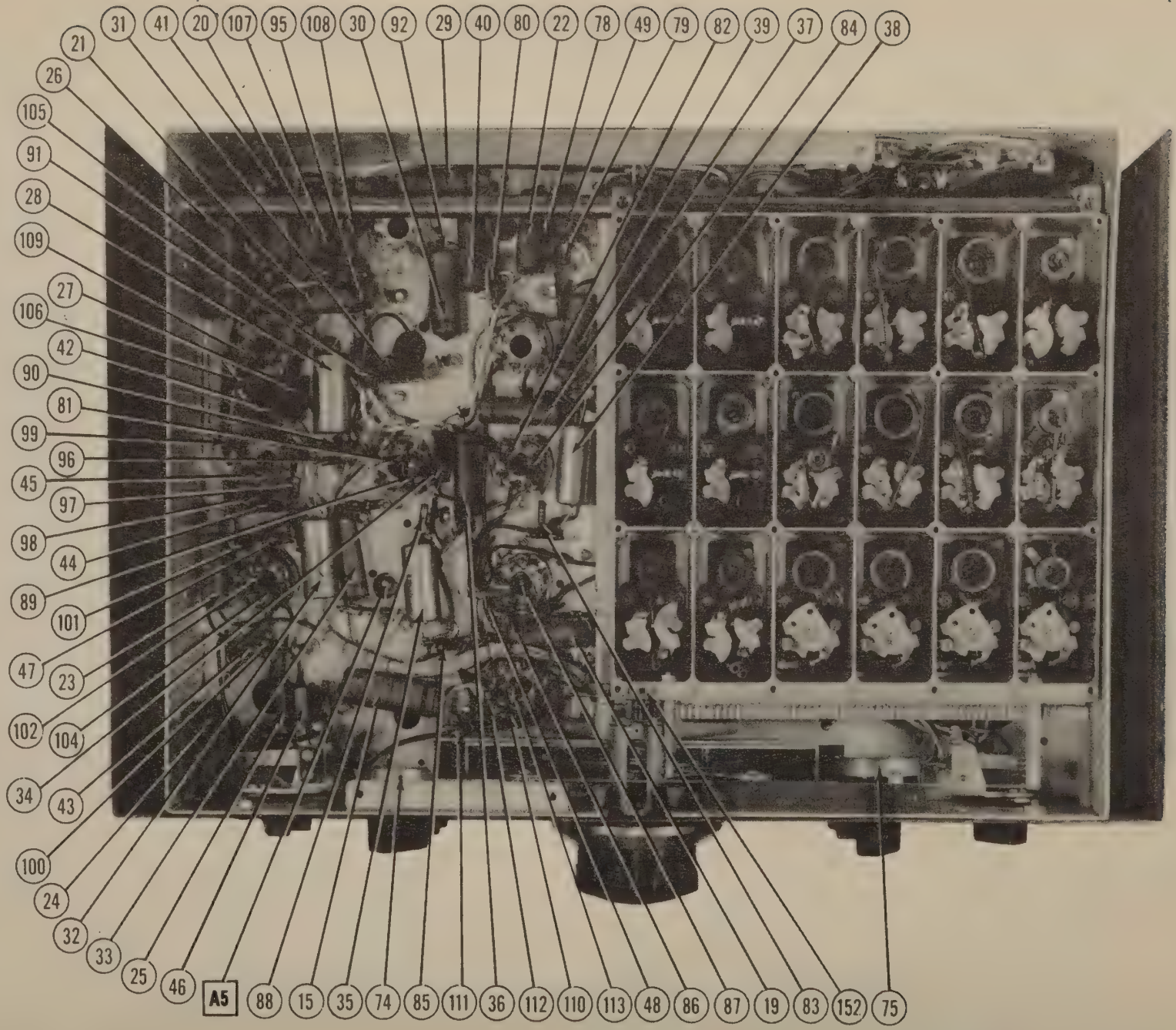
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PARTS LIST AND DESCRIPTIONS (Continued)

65	15.5	500						"B" " " " " "
66	21	500						"C" " " " " "
67	38.5	500						"D" " " " " "
68	16	500						"A" " RF Coupling
69	38	500						"A" " Padder
70	15.5	500						"B" " " " " "
71	21	500						"C" " " " " "
72	38.5	500						"D" " " " " "
73	900	500						"A" " " " " "

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA			INSTALLATION NOTES
	RESISTANCE	WATTS	NATIONAL PART No.	IRC PART No.	CLAROSTAT PART No.	
74A	500KΩ	½		D13-133	M-60-Z	AF Gain Control
B	Shaft			A	Not Req.	Attach to 74A per instructions
75	10KΩ	1½				RF Gain Control
76	10KΩ	1½				Limiter Control
77A	500KΩ	½		D11-133	M-58-S	Tone Control
B	Shaft			A	Not Req.	Attach to 77A per instructions
C	Switch			41	SW-A	" " " " "

RESISTORS

ITEM No.	RATING		REPLACEMENT DATA		IDENTIFICATION CODES
	RESISTANCE	WATTS	NATIONAL PART No.	IRC PART No.	
78	1.5 Meg.	½		BTS-1.5 Meg.	Br.-Grn.-Grn. AVC Network
79	470KΩ	½		BTS-470K	Yl.-Vi.-Yl. " "
80	470Ω	½		BTS-470	Yl.-Vi.-Br. AVC Cathode
81	47KΩ	½		BTS-47K	Yl.-Vi.-Or. Voltage Dropping
82	220Ω	½		BW-½-220	Red-Red-Br. Converter Cathode
83	47KΩ	½		BTS-47K	Yl.-Vi.-Or. Converter Screen Dropping
84	100KΩ	½		BTS-100K	Br.-Blk.-Yl. Bleeder
85	2200Ω	½		BTS-2200	Red-Red-Red Decoupling
86	47KΩ	1		BTA-47K	Yl.-Vi.-Or. Voltage Dropping
87	47KΩ	½		BTS-47K	Yl.-Vi.-Or. Converter Grid
88	22KΩ	½		BTS-22K	Red-Red-Or. AVC Network
89	1500Ω	½			Br.-Grn.-Red 1st IF Cathode-See Note
90	2200Ω	½		BTS-2200	Red-Red-Red 1st IF Decoupling
91	470KΩ	½		BTS-470K	Yl.-Vi.-Yl. AVC Network
92	1000Ω	½			Br.-Blk.-Red 2nd IF Cathode-See Note
93	22KΩ	2		BT-2-22K	Red-Red-Or. Bleeder
94	22KΩ	2		BT-2-22K	Red-Red-Or. Voltage Dropping
95	1000Ω	½		BTS-1000	Br.-Blk.-Red 2nd IF Plate Decoupling
96	2200Ω	½		BTS-2200	Red-Red-Red Detector Plate Decoupling
97	4700Ω	½		BTS-4700	Yl.-Vi.-Red Detector Cathode
98	22KΩ	½		BTS-22K	Red-Red-Or. Detector Output Load
99	100KΩ	½		BTS-100K	Br.-Blk.-Yl. Limiter Cathode
100	47KΩ	½		BTS-47K	Yl.-Vi.-Or. Limiter Grid
101	220KΩ	½		BTS-220K	Red-Red-Yl. BFO Plate Load
102	100KΩ	½		BTS-100K	Br.-Blk.-Yl. BFO Screen Dropping
103	220Ω	2		BW-2-220	Red-Red-Br. Output Cathode
104	100KΩ	½		BTS-100K	Br.-Blk.-Yl. Bleeder
105	470KΩ	½		BTS-470K	Yl.-Vi.-Yl. AVC Network
106	15KΩ	½		BTS-15K	Br.-Grn.-Or. " "
107	2700Ω	2		BT-2-2700	Red-Vi.-Red Bias Network
108	820Ω	2		BT-2-820	Gray-Red-Br. " "
109	1 Meg.	½		BTS-1 Meg.	Br.-Blk.-Grn. " "
110	47KΩ	½		BTS-47KΩ	Yl.-Vi.-Or. AF Plate Load
111	1000Ω	½		BTS-1000	Br.-Blk.-Red AF Cathode
112	47KΩ	½		BTS-47K	Yl.-Vi.-Or. Phase Inverter Plate Load
113	470KΩ	½		BTS-470K	Yl.-Vi.-Yl. Phase Inverter Grid
114	220KΩ	½		BTS-220K	Red-Red-Yl. Output Grid
115	220KΩ	½		BTS-220K	Red-Red-Yl. " "
116	220KΩ	½		BTS-220K	Red-Red-Yl. " "

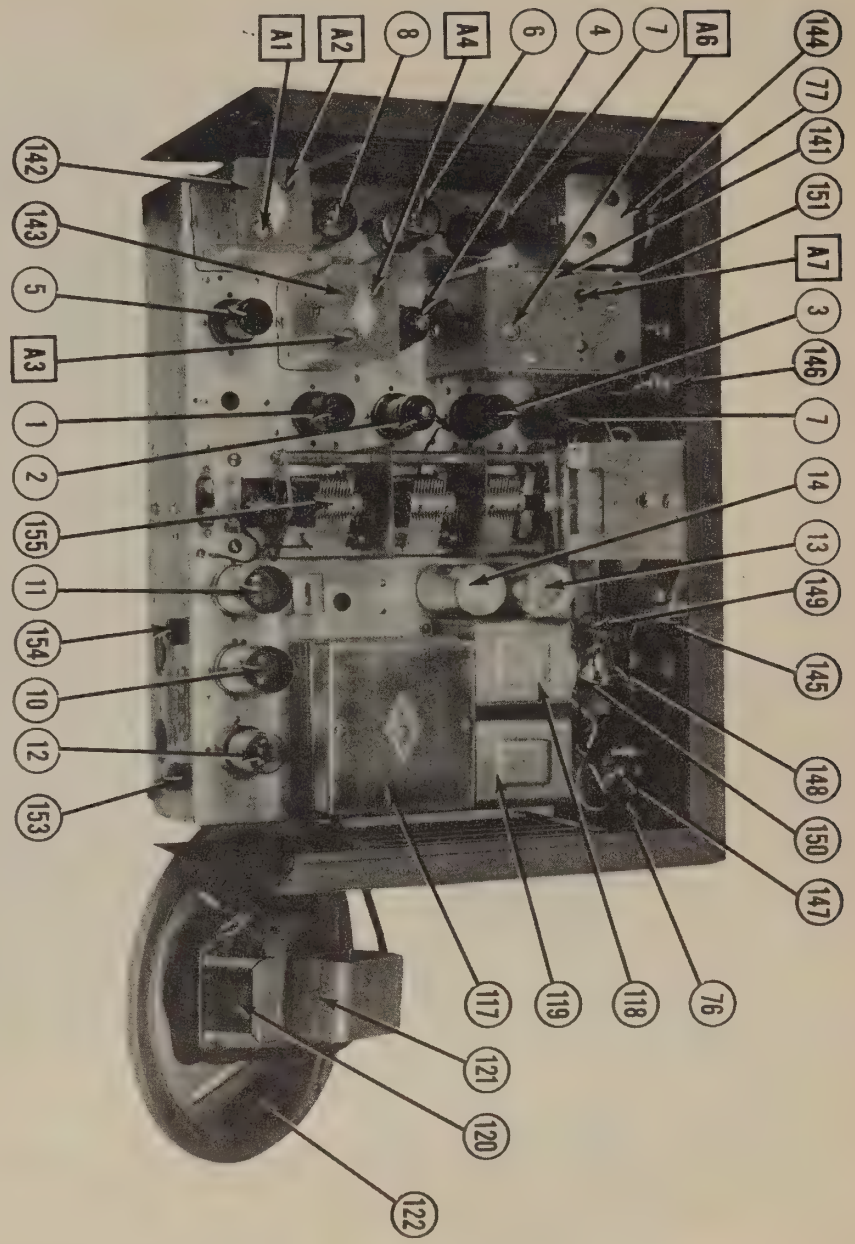
Note-This resistor is selected individually for each receiver and should be replaced according to the value used.

TRANSFORMER (POWER)

ITEM No.	RATING				REPLACEMENT DATA			
	PRI.	SEC. 1	SEC. 2	SEC. 3	NATIONAL PART No.	STANCOR PART No.	THORDARSON PART No.	MERIT PART No.
117	117V AC @ .75A or 230V AC	800V CT @ .093A	5.0V AC @ 2.0A	6.4VAC @ 4.7A		P-6165#		

#This replacement for 117V AC only.

CHASSIS—TOP VIEW



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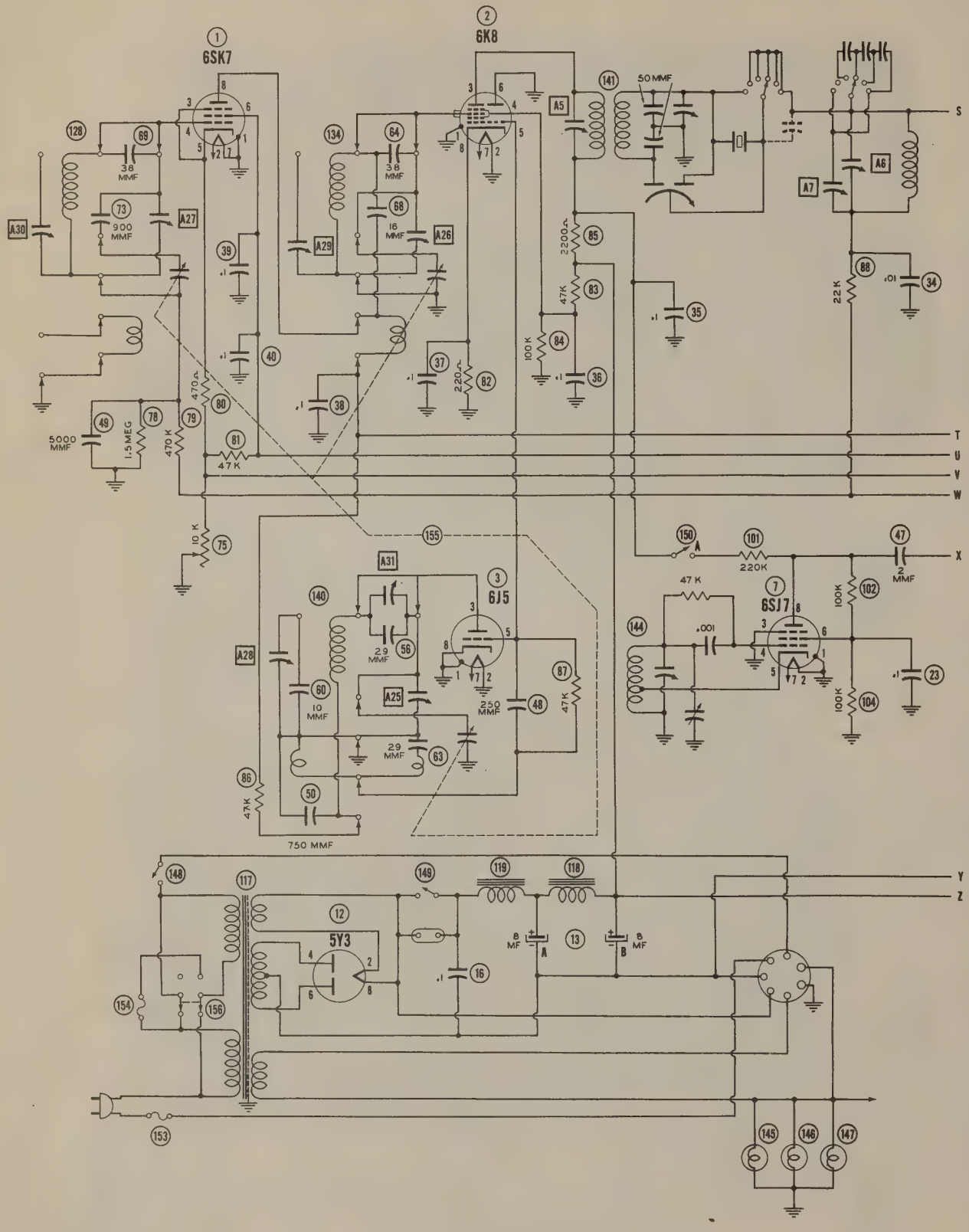

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PARTS LIST AND DESCRIPTIONS

TUBES (SYLVANIA or Equivalent)

ITEM No.	USE	REPLACEMENT DATA: NATIONAL PART No.	REPLACEMENT DATA: STANDARD REPLACEMENT	RMA BASE TYPE	INSTALLATION NOTES
1	RF Amp.		6SK7	8N	
2	Mixer		6K8	8K	
3	Osc.		6J5	6Q	
4	1st IF		6K7	7R	
5	2nd IF		6SK7	8N	
6	2nd Det.-Limiter		6SL7GT	8BD	
7	CW Osc.		6SJ7	8N	
8	AVC		6V6GT	7AC	
9	AF Phase Inv.		6SN7GT	8BD	
10	Power Output		6V6GT	7AC	
11	" "		6V6GT	7AC	
12	Rectifier		5Y3GT	5T	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING: CAP.	RATING: VOLT	REPLACEMENT DATA: NATIONAL PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	SOLAR PART No.	SPRAGUE PART No.	IDENTIFICATION CODES AND INSTALLATION NOTES
13A	8	475		GL-475-8-8	KR588A	DY-2x8-450	EL-1	Filter-Red
B	8	475					WA-8	" -Red-White
14	40	200		GL450-40	KR530	DY-50-350	EL-42	Bias Filter
15	10	50		PRS50-10	BR105	M-10-50	TA-510	Inverter Cathode Bypass
16	.1	600		684-.1	DT6P1	ST-6-1	TC-1	Power Supply Bypass
17	.1	600		684-.1	DT6P1	ST-6-1	TC-1	Audio Coupling
18	.1	400		484-.1	DT4P1	ST-4-1	TC-1	" "
19	.1	400		484-.1	DT4P1	ST-4-1	TC-1	" "
20	.1	400		484-.1	DT4P1	ST-4-1	TC-1	Bias Network
21	.1	400		484-.1	DT4P1	ST-4-1	TC-1	AVC Network
22	.1	400		484-.1	DT4P1	ST-4-1	TC-1	AVC Filter
23	.1	400		484-.1	DT4P1	ST-4-1	TC-1	CW Osc. Screen Bypass
24	.01	600		684-01	DT6S1	ST-6-01	TC-11	Audio Coupling
25	.01	600		684-01	DT6S1	ST-6-01	TC-11	Tone Comp.
26	1	200		484-1	DT2W1	SDH-2-1M	TC-10	Audio Coupling
27	.01	600		684-01	DT6S1	ST-6-01	TC-11	Det. Plate Bypass
28	.1	600		684-.1	DT6P1	ST-6-1	TC-1	2nd IF Plate Decoup.
29	.1	400		484-.1	DT4P1	ST-4-1	TC-1	Screen Bypass
30	.1	400		484-.1	DT4P1	ST-4-1	TC-1	2nd IF Cathode Bypass
31	.01	600		684-01	DT6S1	ST-6-01	TC-11	AVC Filter
32	.1	600		684-.1	DT6P1	ST-6-1	TC-1	1st IF Plate Decoup.
33	.1	400		484-.1	DT4P1	ST-4-1	TC-1	1st IF Cathode Bypass
34	.01	600		684-01	DT6S1	ST-6-01	TC-11	AVC Filter
35	.1	600		684-.1	DT6P1	ST-6-1	TC-1	Conv. Plate Decoup.
36	.1	400		484-.1	DT4P1	ST-4-1	TC-1	Conv. Screen Bypass
37	.1	400		484-.1	DT4P1	ST-4-1	TC-1	Conv. Cathode Bypass
38	.1	600		684-.1	DT6P1	ST-6-1	TC-1	RF Plate Decoupling
39	.1	400		484-.1	DT4P1	ST-4-1	TC-1	Screen Bypass
40	.1	400		484-.1	DT4P1	ST-4-1	TC-1	RF Cathode Bypass
41	.1	400		484-.1	DT4P1	ST-4-1	TC-1	RF Bypass
42	1000	500		1468-001	1W5D1	MW.5-21	1FM-21	AVC Filter
43	250	500		1468-00025	5W5T25	MO.5-325	1FM-325	RF Bypass-Cer.
44	1000	500		1467-001	1W5D1	MW.5-21	1FM-21	" " "
45	250	500		1468-00025	5W5T25	MO.5-325	1FM-325	" " "
46	1000	500		1468-001	1W5D1	MW.5-21	1FM-21	Tone Comp.
47	2	500						CW Osc. Coup. -Cer.
48	250	500		1468-00025	5W5T25	MO.5-325	1FM-325	Osc. Grid Cap.-Cer.
49	5000	300		1467-005	1D5D5	MW.5-25	1FM-25	AVC Filter
50	750	500						"A" Band Osc. Padder
51	3000	500						"B" " " "
52	1700	500						"C" " " "
53	900	500						"D" " " "
54	1500	500						"E" " " " -Cer.
55	250	500						"F" " " " "
56	29	500						"A" " " " "
57	12	500						"B" " " " "
58	18	500						"C" " " " "
59	35	500						"D" " " " "
60	10	500						"A" Band Fixed Trim. "
61	10	500						"B" " " " "
62	10	500						"C" " " " "
63	29	500						"A" " Osc. Feedback "
64	38	500						"A" " RF Padder "

PARTS LIST AND DESCRIPTIONS (Continued)

FILTER CHOKE

ITEM NO.	RATINGS: TOTAL DIRECT CURRENT	RATINGS: D.C. RESISTANCE	RATINGS: INDUCTANCE (0 CURRENT 1000 ~)	REPLACEMENT DATA: NATIONAL PART NO.	STANCOR PART NO.	THORDARSON PART NO.	MERIT PART No.	INSTALLATION NOTES
118	.093A	280Ω	12.5 Henries		C-2305*	T20C54*	C-3193*	*Drill new mounting holes.
119	.093A	280Ω	12.5 "		C-2305*	T20C54*	C-3193*	*Drill new mounting holes.

TRANSFORMER (OUTPUT)

ITEM No.	RATING: IMPEDANCE PRI.	RATING: IMPEDANCE SEC.	RATING: DC RES. PRI.	RATING: DC RES. SEC.	REPLACEMENT DATA: NATIONAL PART No.	STANCOR PART No.	THORDAR'N PART No.	MERIT PART No.	INSTALLATION NOTES
120	9600Ω CT	7.5Ω	480Ω CT	.4Ω		A-3831	T-22856	A-2901	

SPEAKER

ITEM No.	RATINGS		REPLACEMENT DATA: NATIONAL PART No.	JENSEN PART No.	QUAM PART No.	INSTALLATION NOTES
	FIELD	VC IMP.		ST-120	10A6	
121	PM	7.5Ω		Mod. P10-S		
	CONE DIA.	VC DIA.				
122	9-3/4"	7/8"				

R F COILS

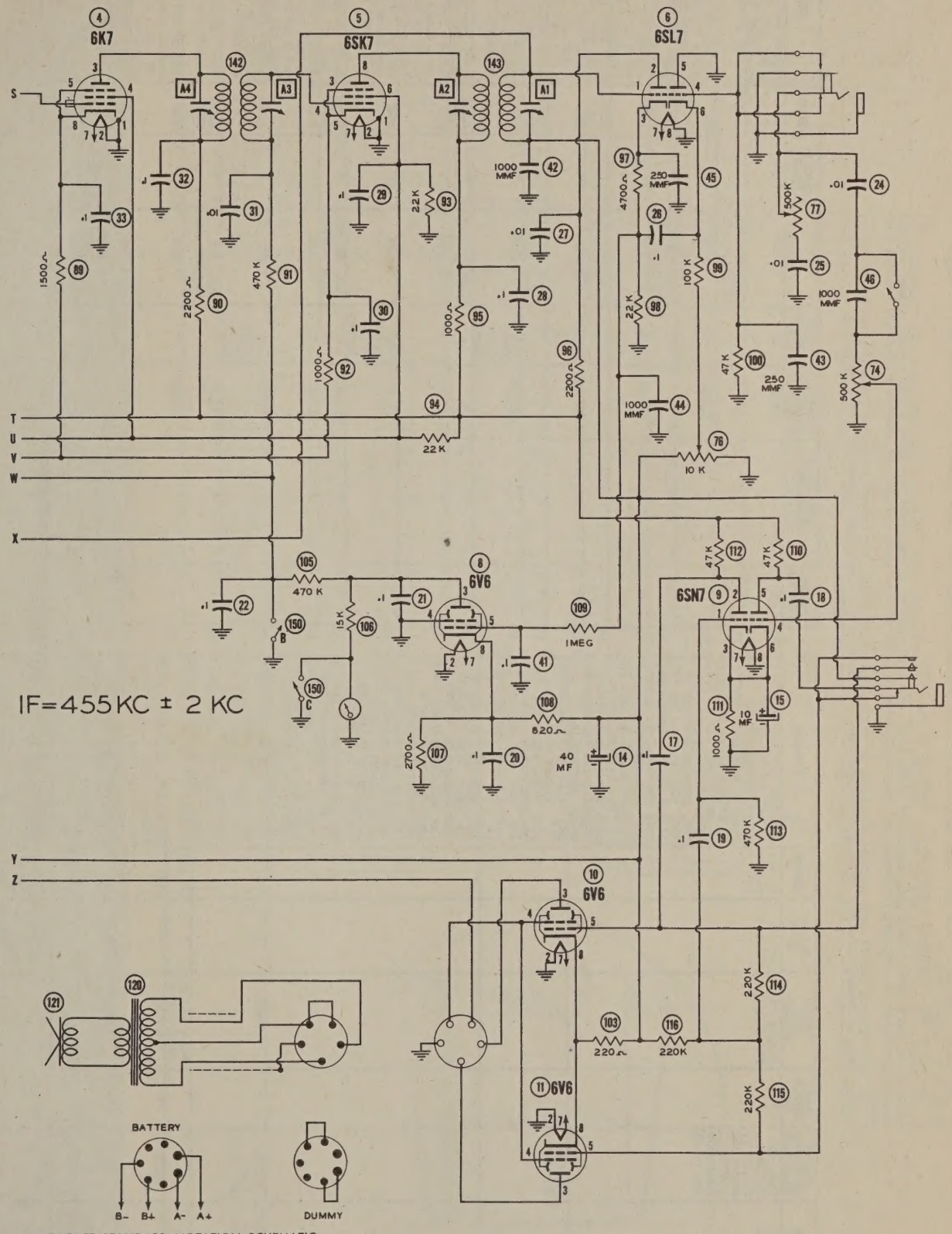
ITEM No.	USE	DC RES. PRI.	DC RES. SEC.	REPLACEMENT DATA: NATIONAL PART No.	MEISSNER PART No.
	BAND				
123	Ant.Coil F	.7Ω	3.4Ω		
124	" " E	1.6Ω	.7Ω		
125	" " D	.6Ω	.3Ω		
126	" " C	.3Ω	.2Ω		
127	" " B	.2Ω	.2Ω		
128	" " A	.1Ω	.1Ω		
129	RF Coil F	.3Ω	2.9Ω		
130	" " E	32.2Ω	1.4Ω		
131	" " D	14.4Ω	.7Ω		
132	" " C	7.7Ω	.3Ω		
133	" " B	2.9Ω	.2Ω		
134	" " A	.2Ω	.1Ω		
135	Osc.Coil F	1.2Ω	1.4Ω		
136	" " E	.7Ω	1.3Ω		
137	" " D	1.2Ω	.7Ω		
138	" " C	.3Ω	.2Ω		
139	" " B	.2Ω	.2Ω		
140	" " A	.6Ω	1.2Ω		
141	Input IF	12.3Ω	9.5Ω		
142	Inter. If	7.8Ω	7.8Ω		
143	Output IF	7Ω	7.6Ω		
144	Osc. Trans		1.2Ω		

DIAL LIGHT

ITEM No.	BASE TYPE	VOLTS	AMPS.	BEAD COLOR	REPLACEMENT DATA: NATIONAL PART No.		INSTALLATION NOTES
145	Screw	6-8	0.15	Brown	No. 40		Type 40
146-147	Bayonet	6-8	0.15	"	No. 47		Type 47

MISCELLANEOUS

ITEM No.	PART NAME	NATIONAL PART No.	NOTES
148	Switch		On-Off
149	"		B+ On-Off
150	"		AVC-MVC-CWO
151	"		Selectivity
152	"		Band
153	Fuse		2 Amp.
154	"		1 Amp.
155	3 Gang Var. Cap		(31-260MMF) each section
156	Switch		Line Voltage (110-120V to 220-240V)



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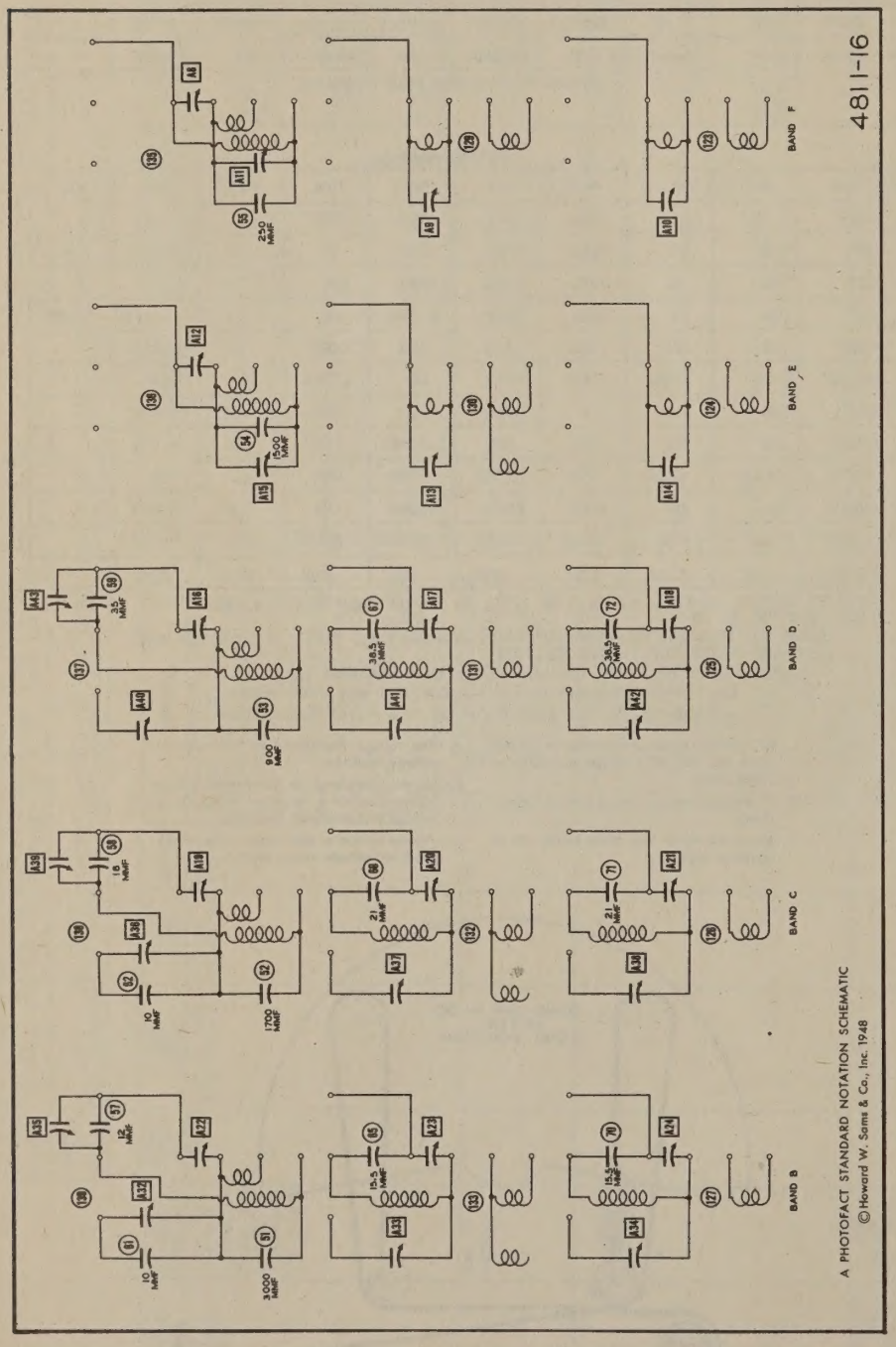
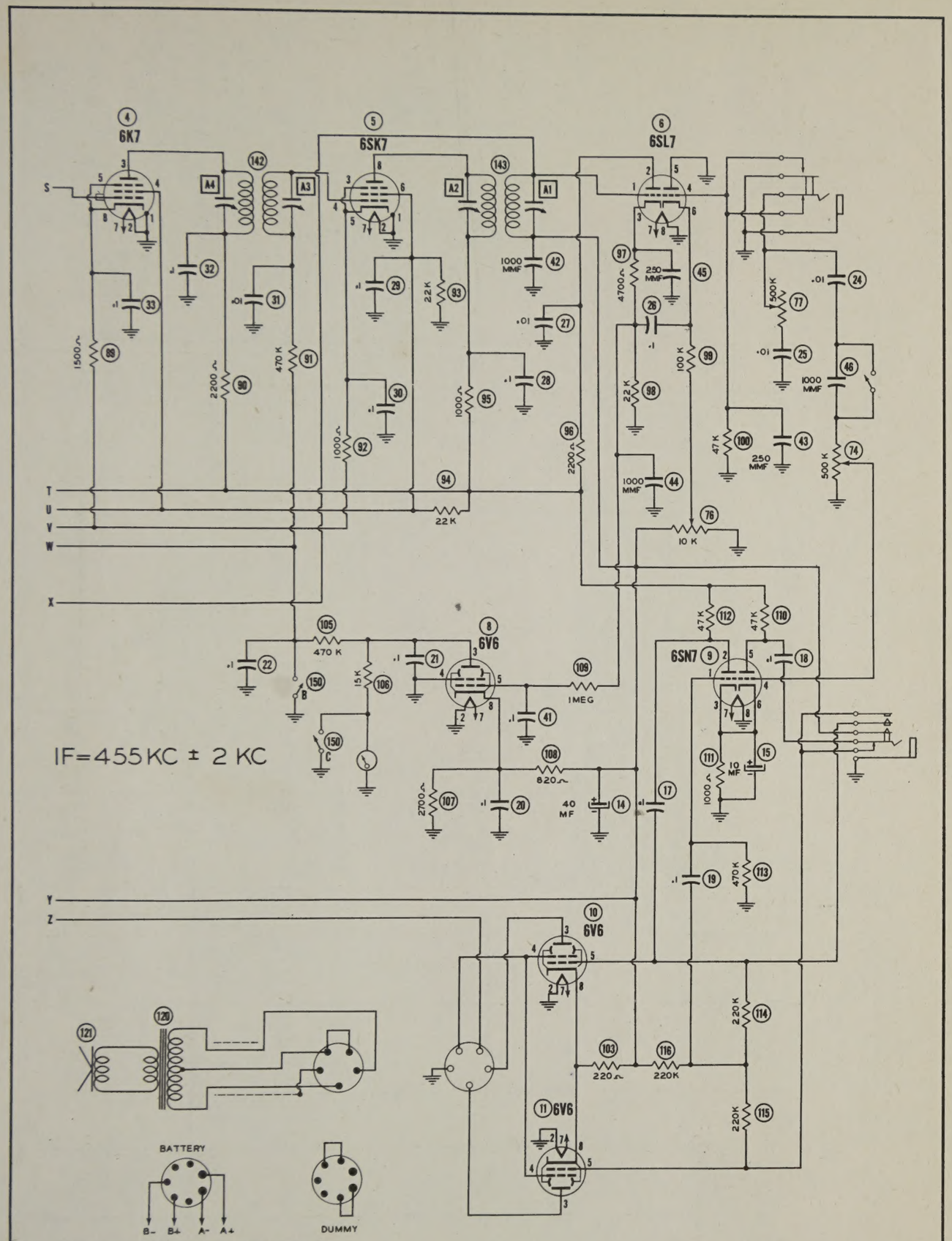
STAGE GAIN MEASUREMENTS			
ANTENNA TO RF GRID	14X		600KC
RF GRID TO CONV. GRID	1.5X		600KC
CONVERSION GAIN	25X	IN OUT	600KC 455KC ± 2%
1st IF TRANSFORMER	.1X		455KC ± 2%
1st IF TUBE	100X		455KC ± 2%
2nd IF TRANSFORMER	.6X		455KC ± 2%
2nd IF TUBE	45X		455KC ± 2%
3rd IF TRANSFORMER	.3X		455KC ± 2%
AUDIO	30X		400 ~
OUTPUT	20X		400 ~



The stage gain measured values listed above approximate values for an average operative stage, rather than an absolute value. It should be borne in mind that it is possible to introduce so many variables into the measurement operation, such as, type of equipment used for measuring, handling and placement of probes, the accuracy of alignment, etc., that an absolute reading is impractical. AVC is made inoperative by connecting negative (-) 3 volts to the AVC line.

7	"	"	2.0MC	E	2.0MC	"	A12	Adjust for maximum output. Check for image per pre-alignment instructions.
8	"	"	"	"	Tune for maximum output.	"	A13, A14	Adjust for maximum output.
9	"	"	1.0MC	"	1.0MC	"	A15	Adjust for maximum output. Repeat Steps 7, 8 & 9 until no further improvement can be made.
27	"	"	4.0MC	"	4.0MC	"80" meter band-spread	"	Adjust for maximum output. Check for image per pre-alignment notes.
28	"	"	"	"	"	"	A41, A42	Rock tuning cap. and adjust for maximum output.
29	"	"	"	"	3.5MC	"	A43	Adjust for maximum output. Repeat Steps 27, 28 & 29 until no further improvement can be made.



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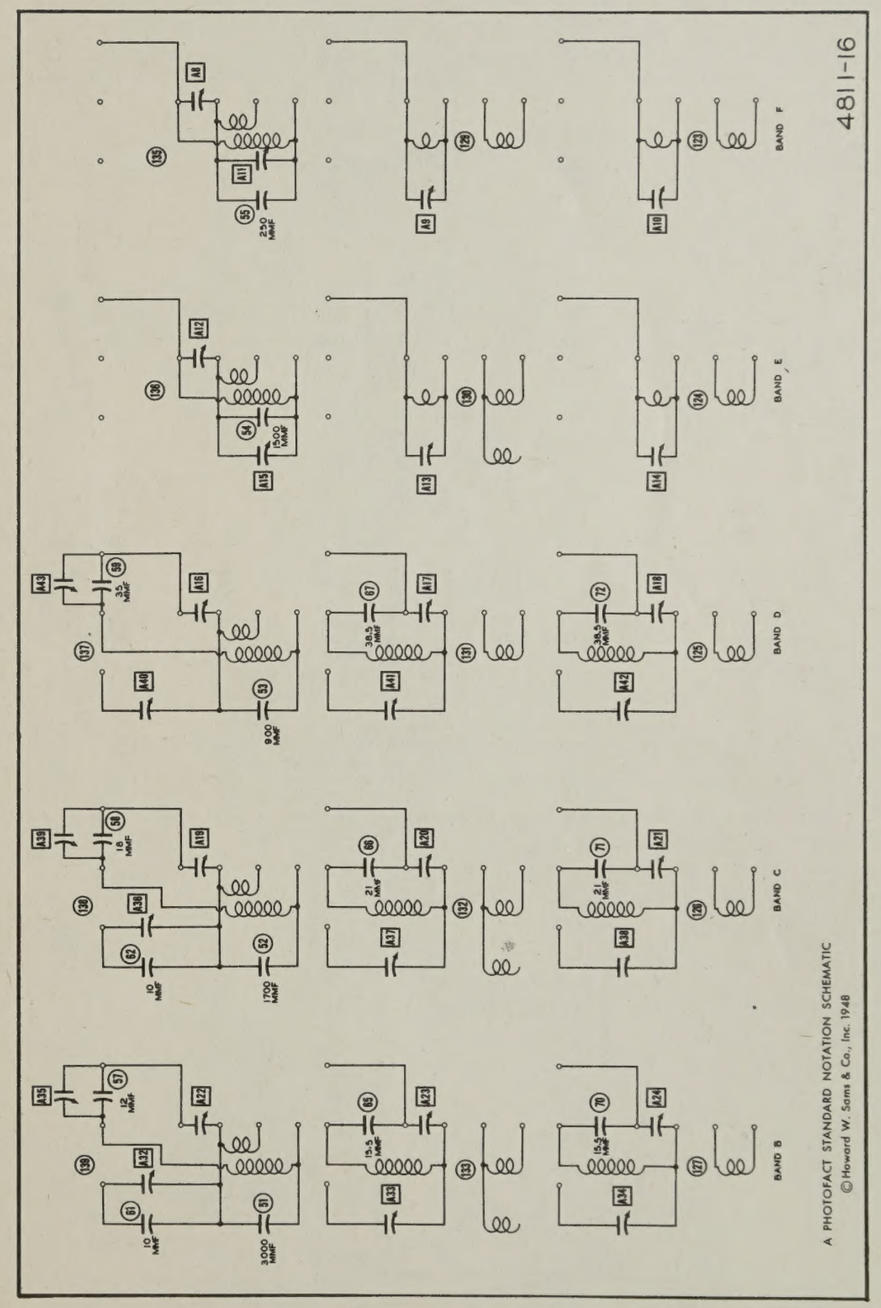
4811-16

STAGE GAIN MEASUREMENTS		
ANTENNA TO RF GRID	14X	600KC
RF GRID TO CONV. GRID	1.5X	600KC
CONVERSION GAIN	25X	IN 600KC OUT 455KC ± 2%
1st IF TRANSFORMER	.1X	455KC ± 2%
1st IF TUBE	100X	455KC ± 2%
2nd IF TRANSFORMER	.6X	455KC ± 2%
2nd IF TUBE	45X	455KC ± 2%
3rd IF TRANSFORMER	.3X	455KC ± 2%
AUDIO	30X	400 ∿
OUTPUT	20X	400 ∿



4811-16

The stage gain measured values listed above approximate values for an average operative stage, rather than an absolute value. It should be borne in mind that it is possible to introduce so many variables into the measurement operation, such as, type of equipment used for measuring, handling and placement of probes, the accuracy of alignment, etc., that an absolute reading is impractical. AVC is made inoperative by connecting negative (-) 3 volts to the AVC line.